

SEQUENCE LISTING

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LUO, Ming  
DUCHAIINE, Thomas



<120> MAMMALIAN STAUFEN AND USE THEREOF

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<140> 09/316,048

<141> 1999-05-21

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Pro Arg Tyr Phe Tyr Pro Phe Pro Val Pro Pro Leu Leu Tyr Gln Val  
 35 40 45

Glu Leu Ser Val Gly Gly Gln Gln Phe Asn Gly Lys Gly Lys Thr Arg  
 50 55 60

Gln Ala Ala Lys His Asp Ala Ala Ala Lys Ala Leu Arg Ile Leu Gln  
 65 70 75 80

Asn Glu Pro Leu Pro Glu Arg Leu Glu Val Asn Gly Arg Glu Ser Glu  
 85 90 95

Glu Glu Asn Leu Asn Lys Ser Glu Ile Ser Gln Val Phe Glu Ile Ala  
 100 105 110

Leu Lys Arg Asn Leu Pro Val Asn Phe Glu Val Ala Arg Glu Ser Gly  
 115 120 125

Pro Pro His Met Lys Asn Phe Val Thr Lys Val Ser Val Gly Glu Phe  
 130 135 140

Val Gly Glu Gly Glu Gly Lys Ser Lys Lys Ile Ser Lys Lys Asn Ala  
 145 150 155 160

Ala	Ile	Ala	Val	Leu	Glu	Glu	Leu	Lys	Lys	Leu	Pro	Pro	Leu	Pro	Ala	165	170	175
Val	Glu	Arg	Val	Lys	Pro	Arg	Ile	Lys	Lys	Lys	Thr	Lys	Pro	Ile	Val	180	185	190
Lys	Pro	Gln	Thr	Ser	Pro	Glu	Tyr	Gly	Gln	Gly	Ile	Asn	Pro	Ile	Ser	195	200	205
Arg	Leu	Ala	Gln	Ile	Gln	Gln	Ala	Lys	Lys	Glu	Lys	Glu	Pro	Glu	Tyr	210	215	220
Thr	Leu	Leu	Thr	Glu	Arg	Gly	Leu	Pro	Arg	Arg	Arg	Glu	Phe	Val	Met	225	230	235
Gln	Val	Lys	Val	Gly	Asn	His	Thr	Ala	Glu	Gly	Thr	Gly	Thr	Asn	Lys	245	250	255
Lys	Val	Ala	Lys	Arg	Asn	Ala	Ala	Glu	Asn	Met	Leu	Glu	Ile	Leu	Gly	260	265	270
Phe	Lys	Val	Pro	Gln	Arg	Gln	Pro	Thr	Lys	Pro	Ala	Leu	Lys	Ser	Glu	275	280	285
Glu	Lys	Thr	Pro	Ile	Lys	Lys	Pro	Gly	Asp	Gly	Arg	Lys	Val	Thr	Phe	290	295	300
Phe	Glu	Pro	Gly	Ser	Gly	Asp	Glu	Asn	Gly	Thr	Ser	Asn	Lys	Glu	Asp	305	310	315
Glu	Phe	Arg	Met	Pro	Tyr	Leu	Ser	His	Gln	Gln	Leu	Pro	Ala	Gly	Ile	325	330	335
Leu	Pro	Met	Val	Pro	Glu	Val	Ala	Gln	Ala	Val	Gly	Val	Ser	Gln	Gly	340	345	350
His	His	Thr	Lys	Asp	Phe	Thr	Arg	Ala	Ala	Pro	Asn	Pro	Ala	Lys	Ala	355	360	365
Thr	Val	Thr	Ala	Met	Ile	Ala	Arg	Glu	Leu	Leu	Tyr	Gly	Gly	Thr	Ser	370	375	380
Pro	Thr	Ala	Glu	Thr	Ile	Leu	Lys	Asn	Asn	Ile	Ser	Ser	Gly	His	Val	385	390	395
Pro	His	Gly	Pro	Leu	Thr	Arg	Pro	Ser	Glu	Gln	Leu	Asp	Tyr	Leu	Ser	405	410	415

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Lys	Asn	Glu	Phe	Val	Ser	Leu	Ile	Asn	Cys	Ser	Ser	Gln	Pro	Pro	Leu
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Ile	Ser	His	Gly	Ile	Gly	Lys	Asp	Val	Glu	Ser	Cys	His	Asp	Met	Ala
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 Met Ser Gln  
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gtt	caa	gtg	caa	gtt	cag	aac	cca	tct	gct	gct	ctc	tca	ggg	agc	caa	465
Val	Gln	Val	Gln	Val	Gln	Asn	Pro	Ser	Ala	Ala	Leu	Ser	Gly	Ser	Gln	
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ata	ctg	aac	aag	aac	cag	tct	ctt	ctc	tca	cag	cct	ttg	atg	agt	att	513
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Ile	Leu	Asn	Lys	Asn	Gln	Ser	Leu	Leu	Ser	Gln	Pro	Leu	Met	Ser	Ile		
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cct	tct	act	act	agc	tct	ctg	ccc	tct	gaa	aat	gca	ggt	aga	ccc	att	561	
Pro	Ser	Thr	Thr	Ser	Ser	Leu	Pro	Ser	Glu	Asn	Ala	Gly	Arg	Pro	Ile		
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caa	aac	tct	gct	tta	ccc	tct	gca	tct	att	aca	tcc	acc	agt	gca	gct	609	
Gln	Asn	Ser	Ala	Leu	Pro	Ser	Ala	Ser	Ile	Thr	Ser	Thr	Ser	Ala	Ala		
				55				60						65			
gca	gaa	agc	ata	acc	cct	act	gta	gaa	cta	aat	gca	ctg	tgc	atg	aaa	657	
Ala	Glu	Ser	Ile	Thr	Pro	Thr	Val	Glu	Leu	Asn	Ala	Leu	Cys	Met	Lys		
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ctt	gga	aaa	aaa	cca	atg	tat	aag	cct	gtt	gac	cct	tac	tct	cgg	atg	705	
Leu	Gly	Lys	Lys	Pro	Met	Tyr	Lys	Pro	Val	Asp	Pro	Tyr	Ser	Arg	Met		
	85					90					95						
cag	tcc	acc	tat	aac	tac	aac	atg	aga	gga	ggt	gct	tat	ccc	ccg	agg	753	
Gln	Ser	Thr	Tyr	Asn	Tyr	Asn	Met	Arg	Gly	Gly	Ala	Tyr	Pro	Pro	Arg		
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tac	ttt	tac	cca	ttt	cca	gtt	cca	cct	tta	ctt	tat	caa	gtg	gaa	ctt	801	
Tyr	Phe	Tyr	Pro	Phe	Pro	Val	Pro	Pro	Leu	Leu	Tyr	Gln	Val	Glu	Leu		
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tct	gtg	gga	gga	cag	caa	ttt	aat	ggc	aaa	gga	aag	aca	aga	cag	gct	849	
Ser	Val	Gly	Gly	Gln	Gln	Phe	Asn	Gly	Lys	Gly	Lys	Thr	Arg	Gln	Ala		
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gcg	aaa	cac	gat	gct	gct	gcc	aaa	gcg	ttg	agg	atc	ctg	cag	aat	gag	897	
Ala	Lys	His	Asp	Ala	Ala	Ala	Lys	Ala	Leu	Arg	Ile	Leu	Gln	Asn	Glu		
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ccc	ctg	cca	gag	agg	ctg	gag	gtg	aat	gga	aga	gaa	tcc	gaa	gaa	gaa	945	
Pro	Leu	Pro	Glu	Arg	Leu	Glu	Val	Asn	Gly	Arg	Glu	Ser	Glu	Glu	Glu		
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aat	ctc	aat	aaa	tct	gaa	ata	agt	caa	gtg	ttt	gag	att	gca	ctt	aaa	993	
Asn	Leu	Asn	Lys	Ser	Glu	Ile	Ser	Gln	Val	Phe	Glu	Ile	Ala	Leu	Lys		
180					185				190						195		
cgg	aac	ttg	cct	gtg	aat	ttc	gag	gtg	gcc	cgg	gag	agt	ggc	cca	ccc	1041	
Arg	Asn	Leu	Pro	Val	Asn	Phe	Glu	Val	Ala	Arg	Glu	Ser	Gly	Pro	Pro		
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His Met Lys Asn Phe Val Thr Lys Val Ser Val Gly Glu Phe Val Gly	
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gaa ggt gaa ggg aaa agc aag aag att tca aag aaa aat gcc gcc ata	1137
Glu Gly Glu Gly Lys Ser Lys Lys Ile Ser Lys Lys Asn Ala Ala Ile	
230 235 240	
gct gtt ctt gag gag ctg aag aag tta ccg ccc ctg cct gca gtt gaa	1185
Ala Val Leu Glu Glu Leu Lys Lys Leu Pro Pro Leu Pro Ala Val Glu	
245 250 255	
cga gta aag cct aga atc aaa aag aaa aca aaa ccc ata gtc aag cca	1233
Arg Val Lys Pro Arg Ile Lys Lys Lys Thr Lys Pro Ile Val Lys Pro	
260 265 270 275	
cag aca agc cca gaa tat ggc cag ggg atc aat ccg att agc cga ctg	1281
Gln Thr Ser Pro Glu Tyr Gly Gln Gly Ile Asn Pro Ile Ser Arg Leu	
280 285 290	
gcc cag atc cag cag gca aaa aag gag aag gag cca gag tac acg ctc	1329
Ala Gln Ile Gln Gln Ala Lys Lys Glu Lys Glu Pro Glu Tyr Thr Leu	
295 300 305	
ctc aca gag cga ggc ctc ccg cgc cgc agg gag ttt gtg atg cag gtg	1377
Leu Thr Glu Arg Gly Leu Pro Arg Arg Arg Glu Phe Val Met Gln Val	
310 315 320	
aag gtt gga aac cac act gca gaa gga acg ggc acc aac aag aag gtg	1425
Lys Val Gly Asn His Thr Ala Glu Gly Thr Gly Thr Asn Lys Lys Val	
325 330 335	
gcc aag cgc aat gca gcc gag aac atg ctg gag atc ctt ggt ttc aaa	1473
Ala Lys Arg Asn Ala Ala Glu Asn Met Leu Glu Ile Leu Gly Phe Lys	
340 345 350 355	
gtc ccg cag cgg cag ccc acc aaa ccc gca ctc aag tca gag gag aag	1521
Val Pro Gln Arg Gln Pro Thr Lys Pro Ala Leu Lys Ser Glu Glu Lys	
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Thr Pro Ile Lys Lys Pro Gly Asp Gly Arg Lys Val Thr Phe Phe Glu	
375 380 385	
cct ggc tct ggg gat gaa aat ggg act agt aat aaa gag gat gag ttc	1617
Pro Gly Ser Gly Asp Glu Asn Gly Thr Ser Asn Lys Glu Asp Glu Phe	
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agg atg cct tat cta agt cat cag cag ctg cct gct gga att ctt ccc	1665



Arg Met Pro Tyr Leu Ser His Gln Gln Leu Pro Ala Gly Ile Leu Pro	
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Met Val Pro Glu Val Ala Gln Ala Val Gly Val Ser Gln Gly His His	
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acc aaa gat ttt acc agg gca gct ccg aat cct gcc aag gcc acg gta	1761
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act gcc atg ata gcc cga gag ttg ttg tat ggg ggc acc tcg ccc aca	1809
Thr Ala Met Ile Ala Arg Glu Leu Leu Tyr Gly Gly Thr Ser Pro Thr	
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gcc gag acc att tta aag aat aac atc tct tca ggc cac gta ccc cat	1857
Ala Glu Thr Ile Leu Lys Asn Asn Ile Ser Ser Gly His Val Pro His	
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Gly Pro Leu Thr Arg Pro Ser Glu Gln Leu Asp Tyr Leu Ser Arg Val	
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cag gga ttc cag gtt gaa tac aaa gac ttc ccc aaa aac aac aag aac	1953
Gln Gly Phe Gln Val Glu Tyr Lys Asp Phe Pro Lys Asn Asn Lys Asn	
500	505 510 515
gaa ttt gta tct ctt atc aat tgc tcc tct cag cca cct ctg atc agc	2001
Glu Phe Val Ser Leu Ile Asn Cys Ser Ser Gln Pro Pro Leu Ile Ser	
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Met	Ser	Ile	Pro	Ser	Thr	Thr	Ser	Ser	Leu	Pro	Ser	Glu	Asn	Ala	Gly	35	40	45	
Arg	Pro	Ile	Gln	Asn	Ser	Ala	Leu	Pro	Ser	Ala	Ser	Ile	Thr	Ser	Thr	50	55	60	
Ser	Ala	Ala	Ala	Glu	Ser	Ile	Thr	Pro	Thr	Val	Glu	Leu	Asn	Ala	Leu	65	70	75	80
Cys	Met	Lys	Leu	Gly	Lys	Lys	Pro	Met	Tyr	Lys	Pro	Val	Asp	Pro	Tyr	85	90	95	
Ser	Arg	Met	Gln	Ser	Thr	Tyr	Asn	Tyr	Asn	Met	Arg	Gly	Gly	Ala	Tyr	100	105	110	
Pro	Pro	Arg	Tyr	Phe	Tyr	Pro	Phe	Pro	Val	Pro	Pro	Leu	Leu	Tyr	Gln	115	120	125	
Val	Glu	Leu	Ser	Val	Gly	Gly	Gln	Gln	Phe	Asn	Gly	Lys	Gly	Lys	Thr	130	135	140	
Arg	Gln	Ala	Ala	Lys	His	Asp	Ala	Ala	Ala	Lys	Ala	Leu	Arg	Ile	Leu	145	150	155	160
Gln	Asn	Glu	Pro	Leu	Pro	Glu	Arg	Leu	Glu	Val	Asn	Gly	Arg	Glu	Ser	165	170	175	
Glu	Glu	Glu	Asn	Leu	Asn	Lys	Ser	Glu	Ile	Ser	Gln	Val	Phe	Glu	Ile	180	185	190	
Ala	Leu	Lys	Arg	Asn	Leu	Pro	Val	Asn	Phe	Glu	Val	Ala	Arg	Glu	Ser	195	200	205	
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Ala	Ala	Ile	Ala	Val	Leu	Glu	Glu	Leu	Lys	Lys	Leu	Pro	Pro	Leu	Pro	245	250	255	

Ala Val Glu Arg Val Lys Pro Arg Ile Lys Lys Lys Thr Lys Pro Ile  
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Val Lys Pro Gln Thr Ser Pro Glu Tyr Gly Gln Gly Ile Asn Pro Ile  
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Ser Arg Leu Ala Gln Ile Gln Gln Ala Lys Lys Glu Lys Glu Pro Glu  
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Tyr Thr Leu Leu Thr Glu Arg Gly Leu Pro Arg Arg Arg Glu Phe Val  
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Met Gln Val Lys Val Gly Asn His Thr Ala Glu Gly Thr Gly Thr Asn  
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Lys Lys Val Ala Lys Arg Asn Ala Ala Glu Asn Met Leu Glu Ile Leu  
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Gly Phe Lys Val Pro Gln Arg Gln Pro Thr Lys Pro Ala Leu Lys Ser  
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Glu Glu Lys Thr Pro Ile Lys Lys Pro Gly Asp Gly Arg Lys Val Thr  
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Phe Phe Glu Pro Gly Ser Gly Asp Glu Asn Gly Thr Ser Asn Lys Glu  
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Asp Glu Phe Arg Met Pro Tyr Leu Ser His Gln Gln Leu Pro Ala Gly  
 405 410 415

Ile Leu Pro Met Val Pro Glu Val Ala Gln Ala Val Gly Val Ser Gln  
 420 425 430

Gly His His Thr Lys Asp Phe Thr Arg Ala Ala Pro Asn Pro Ala Lys  
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Ala Thr Val Thr Ala Met Ile Ala Arg Glu Leu Leu Tyr Gly Gly Thr  
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Ser Pro Thr Ala Glu Thr Ile Leu Lys Asn Asn Ile Ser Ser Gly His  
 465 470 475 480

Val Pro His Gly Pro Leu Thr Arg Pro Ser Glu Gln Leu Asp Tyr Leu  
 485 490 495

Ser Arg Val Gln Gly Phe Gln Val Glu Tyr Lys Asp Phe Pro Lys Asn  
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Asn Lys Asn Glu Phe Val Ser Leu Ile Asn Cys Ser Ser Gln Pro Pro  
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Leu Ile Ser His Gly Ile Gly Lys Asp Val Glu Ser Cys His Asp Met  
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Ala Ala Leu Asn Ile Leu Lys Leu Leu Ser Glu Leu Asp Gln Gln Ser  
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Thr Glu Met Pro Arg Thr Gly Asn Gly Pro Met Ser Val Cys Gly Arg  
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Gly	Ala	Tyr	Pro	Pro	Arg	Tyr	Phe	Tyr	Pro	Phe	Pro	Val	Pro	Pro	Leu	
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Leu	Tyr	Gln	Val	Glu	Leu	Ser	Val	Gly	Gly	Gln	Gln	Phe	Asn	Gly	Lys	
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gga	aag	aca	aga	cag	gct	gcg	aaa	cac	gat	gct	gct	gcc	aaa	gcg	ttg	721
Gly	Lys	Thr	Arg	Gln	Ala	Ala	Lys	His	Asp	Ala	Ala	Ala	Lys	Ala	Leu	
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agg	atc	ctg	cag	aat	gag	ccc	ctg	cca	gag	agg	ctg	gag	gtg	aat	gga	769
Arg	Ile	Leu	Gln	Asn	Glu	Pro	Leu	Pro	Glu	Arg	Leu	Glu	Val	Asn	Gly	
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aga	gaa	tcc	gaa	gaa	gaa	aat	ctc	aat	aaa	tct	gaa	ata	agt	caa	gtg	817
Arg	Glu	Ser	Glu	Glu	Glu	Asn	Leu	Asn	Lys	Ser	Glu	Ile	Ser	Gln	Val	
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Phe	Glu	Ile	Ala	Leu	Lys	Arg	Asn	Leu	Pro	Val	Asn	Phe	Glu	Val	Ala	
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Arg	Glu	Ser	Gly	Pro	Pro	His	Met	Lys	Asn	Phe	Val	Thr	Lys	Val	Ser	
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Val	Gly	Glu	Phe	Val	Gly	Glu	Gly	Glu	Gly	Lys	Ser	Lys	Lys	Ile	Ser	
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Lys	Lys	Asn	Ala	Ala	Ile	Ala	Val	Leu	Glu	Glu	Leu	Lys	Lys	Leu	Pro	
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Pro	Leu	Pro	Ala	Val	Glu	Arg	Val	Lys	Pro	Arg	Ile	Lys	Lys	Lys	Thr	
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aaa	ccc	ata	gtc	aag	cca	cag	aca	agc	cca	gaa	tat	ggc	cag	ggg	atc	1105
Lys	Pro	Ile	Val	Lys	Pro	Gln	Thr	Ser	Pro	Glu	Tyr	Gly	Gln	Gly	Ile	
	190					195					200					
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Asn	Pro	Ile	Ser	Arg	Leu	Ala	Gln	Ile	Gln	Gln	Ala	Lys	Lys	Glu	Lys	
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gag	cca	gag	tac	acg	ctc	ctc	aca	gag	cga	ggc	ctc	ccg	cgc	cgc	agg	1201
Glu	Pro	Glu	Tyr	Thr	Leu	Leu	Thr	Glu	Arg	Gly	Leu	Pro	Arg	Arg	Arg	
				225					230					235		
gag	ttt	gtg	atg	cag	gtg	aag	gtt	gga	aac	cac	act	gca	gaa	gga	acg	1249
Glu	Phe	Val	Met	Gln	Val	Lys	Val	Gly	Asn	His	Thr	Ala	Glu	Gly	Thr	
				240					245				250			
ggc	acc	aac	aag	aag	gtg	gcc	aag	cgc	aat	gca	gcc	gag	aac	atg	ctg	1297
Gly	Thr	Asn	Lys	Lys	Val	Ala	Lys	Arg	Asn	Ala	Ala	Glu	Asn	Met	Leu	
		255					260					265				
gag	atc	ctt	ggt	ttc	aaa	gtc	ccg	cag	cgg	cag	ccc	acc	aaa	ccc	gca	1345
Glu	Ile	Leu	Gly	Phe	Lys	Val	Pro	Gln	Arg	Gln	Pro	Thr	Lys	Pro	Ala	
		270					275				280					
ctc	aag	tca	gag	gag	aag	aca	ccc	ata	aag	aaa	cca	ggg	gat	gga	aga	1393
Leu	Lys	Ser	Glu	Glu	Lys	Thr	Pro	Ile	Lys	Lys	Pro	Gly	Asp	Gly	Arg	
285					290					295					300	
aaa	gta	acc	ttt	ttt	gaa	cct	ggc	tct	ggg	gat	gaa	aat	ggg	act	agt	1441
Lys	Val	Thr	Phe	Phe	Glu	Pro	Gly	Ser	Gly	Asp	Glu	Asn	Gly	Thr	Ser	
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aat	aaa	gag	gat	gag	ttc	agg	atg	cct	tat	cta	agt	cat	cag	cag	ctg	1489
Asn	Lys	Glu	Asp	Glu	Phe	Arg	Met	Pro	Tyr	Leu	Ser	His	Gln	Gln	Leu	
			320					325					330			
cct	gct	gga	att	ctt	ccc	atg	gtg	ccc	gag	gtc	gcc	cag	gct	gta	gga	1537
Pro	Ala	Gly	Ile	Leu	Pro	Met	Val	Pro	Glu	Val	Ala	Gln	Ala	Val	Gly	
		335					340					345				
gtt	agt	caa	gga	cat	cac	acc	aaa	gat	ttt	acc	agg	gca	gct	ccg	aat	1585
Val	Ser	Gln	Gly	His	His	Thr	Lys	Asp	Phe	Thr	Arg	Ala	Ala	Pro	Asn	
		350				355					360					
cct	gcc	aag	gcc	acg	gta	act	gcc	atg	ata	gcc	cga	gag	ttg	ttg	tat	1633
Pro	Ala	Lys	Ala	Thr	Val	Thr	Ala	Met	Ile	Ala	Arg	Glu	Leu	Leu	Tyr	
365					370					375					380	
ggg	ggc	acc	tcg	ccc	aca	gcc	gag	acc	att	tta	aag	aat	aac	atc	tct	1681
Gly	Gly	Thr	Ser	Pro	Thr	Ala	Glu	Thr	Ile	Leu	Lys	Asn	Asn	Ile	Ser	
				385					390					395		
tca	ggc	cac	gta	ccc	cat	gga	cct	ctc	acg	aga	ccc	tct	gag	caa	ctg	1729

Ser Gly His Val Pro His Gly Pro Leu Thr Arg Pro Ser Glu Gln Leu	
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Asp Tyr Leu Ser Arg Val Gln Gly Phe Gln Val Glu Tyr Lys Asp Phe	
415	420 425
ccc aaa aac aac aag aac gaa ttt gta tct ctt atc aat tgc tcc tct	1825
Pro Lys Asn Asn Lys Asn Glu Phe Val Ser Leu Ile Asn Cys Ser Ser	
430	435 440
cag cca cct ctg atc agc cat ggt atc ggc aag gat gtg gag tcc tgc	1873
Gln Pro Pro Leu Ile Ser His Gly Ile Gly Lys Asp Val Glu Ser Cys	
445	450 455 460
cat gat atg gct gcg ctg aac atc tta aag ttg ctg tct gag ttg gac	1921
His Asp Met Ala Ala Leu Asn Ile Leu Lys Leu Leu Ser Glu Leu Asp	
465	470 475
caa caa agt aca gag atg cca aga aca gga aac gga cca atg tct gtg	1969
Gln Gln Ser Thr Glu Met Pro Arg Thr Gly Asn Gly Pro Met Ser Val	
480	485 490
tgt ggg agg tgc tgaacctttt ctggccatga accattataa aatcccaaca	2021
Cys Gly Arg Cys	
495	
tatatactga aaatactgaa actgctttga aaatttgga tttctgatac ctccagtggg	2081
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<212> PRT
<213> Homo sapiens

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      20             25             30

Pro Arg Tyr Phe Tyr Pro Phe Pro Val Pro Pro Leu Leu Tyr Gln Val
      35             40             45

Glu Leu Ser Val Gly Gly Gln Gln Phe Asn Gly Lys Gly Lys Thr Arg
      50             55             60

Gln Ala Ala Lys His Asp Ala Ala Ala Lys Ala Leu Arg Ile Leu Gln
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Asn Glu Pro Leu Pro Glu Arg Leu Glu Val Asn Gly Arg Glu Ser Glu

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Leu Lys Arg Asn Leu Pro Val Asn Phe Glu Val Ala Arg Glu Ser Gly					
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Pro Pro His Met Lys Asn Phe Val Thr Lys Val Ser Val Gly Glu Phe					
	130		135		140
Val Gly Glu Gly Glu Gly Lys Ser Lys Lys Ile Ser Lys Lys Asn Ala					
145		150		155	160
Ala Ile Ala Val Leu Glu Glu Leu Lys Lys Leu Pro Pro Leu Pro Ala					
	165		170		175
Val Glu Arg Val Lys Pro Arg Ile Lys Lys Lys Thr Lys Pro Ile Val					
	180		185		190
Lys Pro Gln Thr Ser Pro Glu Tyr Gly Gln Gly Ile Asn Pro Ile Ser					
	195		200		205
Arg Leu Ala Gln Ile Gln Gln Ala Lys Lys Glu Lys Glu Pro Glu Tyr					
	210		215		220
Thr Leu Leu Thr Glu Arg Gly Leu Pro Arg Arg Arg Glu Phe Val Met					
225		230		235	240
Gln Val Lys Val Gly Asn His Thr Ala Glu Gly Thr Gly Thr Asn Lys					
	245		250		255
Lys Val Ala Lys Arg Asn Ala Ala Glu Asn Met Leu Glu Ile Leu Gly					
	260		265		270
Phe Lys Val Pro Gln Arg Gln Pro Thr Lys Pro Ala Leu Lys Ser Glu					
	275		280		285
Glu Lys Thr Pro Ile Lys Lys Pro Gly Asp Gly Arg Lys Val Thr Phe					
	290		295		300
Phe Glu Pro Gly Ser Gly Asp Glu Asn Gly Thr Ser Asn Lys Glu Asp					
305		310		315	320
Glu Phe Arg Met Pro Tyr Leu Ser His Gln Gln Leu Pro Ala Gly Ile					
	325		330		335
Leu Pro Met Val Pro Glu Val Ala Gln Ala Val Gly Val Ser Gln Gly					

340	345	350
His His Thr Lys Asp Phe Thr Arg Ala Ala Pro Asn Pro Ala Lys Ala		
355	360	365
Thr Val Thr Ala Met Ile Ala Arg Glu Leu Leu Tyr Gly Gly Thr Ser		
370	375	380
Pro Thr Ala Glu Thr Ile Leu Lys Asn Asn Ile Ser Ser Gly His Val		
385	390	395 400
Pro His Gly Pro Leu Thr Arg Pro Ser Glu Gln Leu Asp Tyr Leu Ser		
405	410	415
Arg Val Gln Gly Phe Gln Val Glu Tyr Lys Asp Phe Pro Lys Asn Asn		
420	425	430
Lys Asn Glu Phe Val Ser Leu Ile Asn Cys Ser Ser Gln Pro Pro Leu		
435	440	445
Ile Ser His Gly Ile Gly Lys Asp Val Glu Ser Cys His Asp Met Ala		
450	455	460
Ala Leu Asn Ile Leu Lys Leu Leu Ser Glu Leu Asp Gln Gln Ser Thr		
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<222> (3)..(1784)

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<222> (324)..(1784)

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Ser Arg Ser Ser Ala Phe Ala Leu Ala Val Val Ala Ser Val Cys Ala	
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ccc cct tct tct gag ccc cgg cct ggc ggc gcc cgc ctt cgc ctc cgc	143
Pro Pro Ser Ser Glu Pro Arg Pro Gly Gly Ala Arg Leu Arg Leu Arg	
35 40 45	
cac tcc gcc tct tcc ctc ctc tgg tgc gcc cct ttt tcc tgc ccg tct	191
His Ser Ala Ser Ser Leu Leu Trp Ser Ala Pro Phe Ser Ser Pro Ser	
50 55 60	
tca ctt gct tct tca cct cct cgc cgc cgc cca aga ccg ccg gcc ccg	239
Ser Leu Ala Ser Ser Pro Pro Arg Arg Arg Pro Arg Pro Pro Ala Pro	
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gga cga gct ctg ggg aag cag cca gaa agt ata gct tct acc att gag	287
Gly Arg Ala Leu Gly Lys Gln Pro Glu Ser Ile Ala Ser Thr Ile Glu	
80 85 90 95	
ctc aat gca ctg tgt gtg aaa ctg gaa aga aaa cca atg tat aag ccc	335
Leu Asn Ala Leu Cys Val Lys Leu Glu Arg Lys Pro Met Tyr Lys Pro	
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gtg gac cct cac tct cgg atg cag tcc acc tac agc tat ggc atg cgt	383
Val Asp Pro His Ser Arg Met Gln Ser Thr Tyr Ser Tyr Gly Met Arg	
115 120 125	
gga ggt gcc tat ccc ccc aga tac ttt tac cca ttt cca gtc cca cct	431
Gly Gly Ala Tyr Pro Pro Arg Tyr Phe Tyr Pro Phe Pro Val Pro Pro	
130 135 140	
tta ctc tac caa gtt gag ctc tcc gtg ggc gga cag cag ttt aat ggg	479
Leu Leu Tyr Gln Val Glu Leu Ser Val Gly Gly Gln Gln Phe Asn Gly	
145 150 155	
aaa gga aag atg aga cca ccc gtg aaa cac gat gcc cct gcc cgt gcg	527
Lys Gly Lys Met Arg Pro Pro Val Lys His Asp Ala Pro Ala Arg Ala	
160 165 170 175	
ctg agg act ctg cag agt gaa ccc ctg cca gaa agg ttg gag gta aat	575
Leu Arg Thr Leu Gln Ser Glu Pro Leu Pro Glu Arg Leu Glu Val Asn	
180 185 190	
gga aga gaa gca gag gaa gaa aac ctc aat aaa tgc gaa ata agc caa	623
Gly Arg Glu Ala Glu Glu Glu Asn Leu Asn Lys Ser Glu Ile Ser Gln	
195 200 205	

gtg ttt gaa att gcg ctg aag cgg aat ttg cct gtg aat ttt gag gtg	671
Val Phe Glu Ile Ala Leu Lys Arg Asn Leu Pro Val Asn Phe Glu Val	
210 215 220	
gcc cgg gag agt ggc cca cca cac atg aag aac ttt gtg acc agg gtt	719
Ala Arg Glu Ser Gly Pro Pro His Met Lys Asn Phe Val Thr Arg Val	
225 230 235	
tca gtt ggg gaa ttt gta ggg gaa gga gaa ggg aaa agc aag aag atc	767
Ser Val Gly Glu Phe Val Gly Glu Gly Glu Gly Lys Ser Lys Lys Ile	
240 245 250 255	
tcc aag aag aat gcg gcc agg gct gtt ctg gag cag ctt agg agg ctg	815
Ser Lys Lys Asn Ala Ala Arg Ala Val Leu Glu Gln Leu Arg Arg Leu	
260 265 270	
cca ccc ctc cct gct gtg gag cga gtg aag ccc aga atc aag aag aaa	863
Pro Pro Leu Pro Ala Val Glu Arg Val Lys Pro Arg Ile Lys Lys Lys	
275 280 285	
agt cag ccc acc tgc aag aca gcc ccg gat tat ggc caa ggg atg aat	911
Ser Gln Pro Thr Cys Lys Thr Ala Pro Asp Tyr Gly Gln Gly Met Asn	
290 295 300	
cct att agt aga ctt gca cag atc cag cag gca aaa aag gag aag gag	959
Pro Ile Ser Arg Leu Ala Gln Ile Gln Gln Ala Lys Lys Glu Lys Glu	
305 310 315	
cca gag tac atg ctc ctt aca gaa cga ggt ctt cca cgt cgc agg gag	1007
Pro Glu Tyr Met Leu Leu Thr Glu Arg Gly Leu Pro Arg Arg Arg Glu	
320 325 330 335	
ttt gtg atg cag gta aag gtt ggg cat cac act gca gaa gga gtg ggt	1055
Phe Val Met Gln Val Lys Val Gly His His Thr Ala Glu Gly Val Gly	
340 345 350	
acc aat aag aag gtg gcc aag cgt aat gct gct gag aac atg ctg gag	1103
Thr Asn Lys Lys Val Ala Lys Arg Asn Ala Ala Glu Asn Met Leu Glu	
355 360 365	
atc ctg ggg ttc aaa gtt ccc cag gcg cag cct gcc aag cca gca ctc	1151
Ile Leu Gly Phe Lys Val Pro Gln Ala Gln Pro Ala Lys Pro Ala Leu	
370 375 380	
aaa tca gaa gag aag act cca gta aag aaa cca gga gac gga agg aaa	1199
Lys Ser Glu Glu Lys Thr Pro Val Lys Lys Pro Gly Asp Gly Arg Lys	
385 390 395	

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Ala Gly Ile Leu Pro Met Val Pro Glu Val Ala Gln Ala Val Gly Val	
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Ala Lys Ala Thr Val Thr Ala Met Ile Ala Arg Glu Leu Leu Tyr Gly	
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Gly Thr Ser Pro Thr Ala Glu Thr Ile Leu Lys Ser Asn Ile Ser Ser	
480 485 490 495	
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Gly His Val Pro His Gly Pro Arg Thr Arg Pro Ser Glu Gln Leu Tyr	
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tac ctt tcc aga gcc cag gga ttc cag gtt gaa tac aaa gat ttt ccc	1583
Tyr Leu Ser Arg Ala Gln Gly Phe Gln Val Glu Tyr Lys Asp Phe Pro	
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Lys Asn Asn Lys Asn Glu Cys Val Ser Leu Ile Asn Cys Ser Ser Gln	
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ccg cct ctc gtc agt cat ggc atc ggc aag gat gtg gag tcc tgt cat	1679
Pro Pro Leu Val Ser His Gly Ile Gly Lys Asp Val Glu Ser Cys His	
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gat atg gct gca ctg aac att tta aag ctg ctg tct gag ttg gac caa	1727
Asp Met Ala Ala Leu Asn Ile Leu Lys Leu Leu Ser Glu Leu Asp Gln	
560 565 570 575	
cag agc aca gag atg cca aga aca gga aat gga cca gtt tca gcg tgc	1775
Gln Ser Thr Glu Met Pro Arg Thr Gly Asn Gly Pro Val Ser Ala Cys	
580 585 590	

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 Gly Arg Cys

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<212> PRT

<213> Mus musculus

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Ser Ala Ser Ser Leu Leu Trp Ser Ala Pro Phe Ser Ser Pro Ser Ser			
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Leu Ala Ser Ser Pro Pro Arg Arg Arg Pro Arg Pro Pro Ala Pro Gly			
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Arg Ala Leu Gly Lys Gln Pro Glu Ser Ile Ala Ser Thr Ile Glu Leu			
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Asn Ala Leu Cys Val Lys Leu Glu Arg Lys Pro Met Tyr Lys Pro Val			
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Asp Pro His Ser Arg Met Gln Ser Thr Tyr Ser Tyr Gly Met Arg Gly			
115	120	125	
Gly Ala Tyr Pro Pro Arg Tyr Phe Tyr Pro Phe Pro Val Pro Pro Leu			
130	135	140	
Leu Tyr Gln Val Glu Leu Ser Val Gly Gly Gln Gln Phe Asn Gly Lys			
145	150	155	160
Gly Lys Met Arg Pro Pro Val Lys His Asp Ala Pro Ala Arg Ala Leu			
165	170	175	
Arg Thr Leu Gln Ser Glu Pro Leu Pro Glu Arg Leu Glu Val Asn Gly			
180	185	190	
Arg Glu Ala Glu Glu Glu Asn Leu Asn Lys Ser Glu Ile Ser Gln Val			
195	200	205	
Phe Glu Ile Ala Leu Lys Arg Asn Leu Pro Val Asn Phe Glu Val Ala			
210	215	220	
Arg Glu Ser Gly Pro Pro His Met Lys Asn Phe Val Thr Arg Val Ser			
225	230	235	240
Val Gly Glu Phe Val Gly Glu Gly Glu Gly Lys Ser Lys Lys Ile Ser			
245	250	255	
Lys Lys Asn Ala Ala Arg Ala Val Leu Glu Gln Leu Arg Arg Leu Pro			
260	265	270	
Pro Leu Pro Ala Val Glu Arg Val Lys Pro Arg Ile Lys Lys Lys Ser			
275	280	285	
Gln Pro Thr Cys Lys Thr Ala Pro Asp Tyr Gly Gln Gly Met Asn Pro			
290	295	300	
Ile Ser Arg Leu Ala Gln Ile Gln Gln Ala Lys Lys Glu Lys Glu Pro			
305	310	315	320
Glu Tyr Met Leu Leu Thr Glu Arg Gly Leu Pro Arg Arg Arg Glu Phe			
325	330	335	
Val Met Gln Val Lys Val Gly His His Thr Ala Glu Gly Val Gly Thr			
340	345	350	
Asn Lys Lys Val Ala Lys Arg Asn Ala Ala Glu Asn Met Leu Glu Ile			
355	360	365	
Leu Gly Phe Lys Val Pro Gln Ala Gln Pro Ala Lys Pro Ala Leu Lys			
370	375	380	
Ser Glu Glu Lys Thr Pro Val Lys Lys Pro Gly Asp Gly Arg Lys Val			



385		390		395		400
Thr Phe Phe Glu Pro Ser Pro Gly Asp Glu Asn Gly Thr Ser Asn Lys						
	405		410		415	
Asp Glu Glu Phe Arg Met Pro Tyr Leu Ser His Gln Gln Leu Pro Ala						
	420		425		430	
Gly Ile Leu Pro Met Val Pro Glu Val Ala Gln Ala Val Gly Val Ser						
	435		440		445	
Gln Gly His His Thr Lys Asp Phe Thr Arg Ala Ala Pro Asn Pro Ala						
	450		455		460	
Lys Ala Thr Val Thr Ala Met Ile Ala Arg Glu Leu Leu Tyr Gly Gly						
465		470		475		480
Thr Ser Pro Thr Ala Glu Thr Ile Leu Lys Ser Asn Ile Ser Ser Gly						
	485		490		495	
His Val Pro His Gly Pro Arg Thr Arg Pro Ser Glu Gln Leu Tyr Tyr						
	500		505		510	
Leu Ser Arg Ala Gln Gly Phe Gln Val Glu Tyr Lys Asp Phe Pro Lys						
	515		520		525	
Asn Asn Lys Asn Glu Cys Val Ser Leu Ile Asn Cys Ser Ser Gln Pro						
	530		535		540	
Pro Leu Val Ser His Gly Ile Gly Lys Asp Val Glu Ser Cys His Asp						
545		550		555		560
Met Ala Ala Leu Asn Ile Leu Lys Leu Leu Ser Glu Leu Asp Gln Gln						
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Ser Thr Glu Met Pro Arg Thr Gly Asn Gly Pro Val Ser Ala Cys Gly						
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<211> 487

<212> PRT

<213> Mus musculus

<400> 11

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Pro Val Pro Pro Leu Leu Tyr Gln Val Glu Leu Ser Val Gly Gly Gln						
	35		40		45	
Gln Phe Asn Gly Lys Gly Lys Met Arg Pro Pro Val Lys His Asp Ala						
	50		55		60	
Pro Ala Arg Ala Leu Arg Thr Leu Gln Ser Glu Pro Leu Pro Glu Arg						
65		70		75		80
Leu Glu Val Asn Gly Arg Glu Ala Glu Glu Asn Leu Asn Lys Ser						
	85		90		95	
Glu Ile Ser Gln Val Phe Glu Ile Ala Leu Lys Arg Asn Leu Pro Val						
	100		105		110	

Asn	Phe	Glu	Val	Ala	Arg	Glu	Ser	Gly	Pro	Pro	His	Met	Lys	Asn	Phe	115	120	125
Val	Thr	Arg	Val	Ser	Val	Gly	Glu	Phe	Val	Gly	Glu	Gly	Glu	Gly	Lys	130	135	140
Ser	Lys	Lys	Ile	Ser	Lys	Lys	Asn	Ala	Ala	Arg	Ala	Val	Leu	Glu	Gln	145	150	155
Leu	Arg	Arg	Leu	Pro	Pro	Leu	Pro	Ala	Val	Glu	Arg	Val	Lys	Pro	Arg	165	170	175
Ile	Lys	Lys	Lys	Ser	Gln	Pro	Thr	Cys	Lys	Thr	Ala	Pro	Asp	Tyr	Gly	180	185	190
Gln	Gly	Met	Asn	Pro	Ile	Ser	Arg	Leu	Ala	Gln	Ile	Gln	Gln	Ala	Lys	195	200	205
Lys	Glu	Lys	Glu	Pro	Glu	Tyr	Met	Leu	Leu	Thr	Glu	Arg	Gly	Leu	Pro	210	215	220
Arg	Arg	Arg	Glu	Phe	Val	Met	Gln	Val	Lys	Val	Gly	His	His	Thr	Ala	225	230	235
Glu	Gly	Val	Gly	Thr	Asn	Lys	Lys	Val	Ala	Lys	Arg	Asn	Ala	Ala	Glu	245	250	255
Asn	Met	Leu	Glu	Ile	Leu	Gly	Phe	Lys	Val	Pro	Gln	Ala	Gln	Pro	Ala	260	265	270
Lys	Pro	Ala	Leu	Lys	Ser	Glu	Glu	Lys	Thr	Pro	Val	Lys	Lys	Pro	Gly	275	280	285
Asp	Gly	Arg	Lys	Val	Thr	Phe	Phe	Glu	Pro	Ser	Pro	Gly	Asp	Glu	Asn	290	295	300
Gly	Thr	Ser	Asn	Lys	Asp	Glu	Glu	Phe	Arg	Met	Pro	Tyr	Leu	Ser	His	305	310	315
Gln	Gln	Leu	Pro	Ala	Gly	Ile	Leu	Pro	Met	Val	Pro	Glu	Val	Ala	Gln	325	330	335
Ala	Val	Gly	Val	Ser	Gln	Gly	His	His	Thr	Lys	Asp	Phe	Thr	Arg	Ala	340	345	350
Ala	Pro	Asn	Pro	Ala	Lys	Ala	Thr	Val	Thr	Ala	Met	Ile	Ala	Arg	Glu	355	360	365
Leu	Leu	Tyr	Gly	Gly	Thr	Ser	Pro	Thr	Ala	Glu	Thr	Ile	Leu	Lys	Ser	370	375	380
Asn	Ile	Ser	Ser	Gly	His	Val	Pro	His	Gly	Pro	Arg	Thr	Arg	Pro	Ser	385	390	395
Glu	Gln	Leu	Tyr	Tyr	Leu	Ser	Arg	Ala	Gln	Gly	Phe	Gln	Val	Glu	Tyr	405	410	415
Lys	Asp	Phe	Pro	Lys	Asn	Asn	Lys	Asn	Glu	Cys	Val	Ser	Leu	Ile	Asn	420	425	430
Cys	Ser	Ser	Gln	Pro	Pro	Leu	Val	Ser	His	Gly	Ile	Gly	Lys	Asp	Val	435	440	445
Glu	Ser	Cys	His	Asp	Met	Ala	Ala	Leu	Asn	Ile	Leu	Lys	Leu	Leu	Ser	450	455	460
Glu	Leu	Asp	Gln	Gln	Ser	Thr	Glu	Met	Pro	Arg	Thr	Gly	Asn	Gly	Pro	465	470	475
Val	Ser	Ala	Cys	Gly	Arg	Cys										485		

<210> 12  
<211> 16  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide

<400> 12  
agcttaatta gctgac

16

<210> 13  
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16

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31

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36

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<211> 27

<212> DNA

<213> Artificial Sequence

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27

<210> 17

<211> 29

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:  
oligonucleotide

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29

<210> 18

<211> 29

<212> DNA

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<223> Description of Artificial Sequence:  
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29

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<212> DNA

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22

<210> 20

<211> 36

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:  
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36

<210> 21

<211> 18

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:  
oligonucleotide

<400> 21

atagcccgag agttgttg

18

<210> 22

<211> 36

<212> DNA

<213> Artificial Sequence

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<400> 22

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36

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<210> 24  
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<400> 24  
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<210> 25  
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<400> 25  
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<210> 26  
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oligonucleotide

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40

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oligonucleotide

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Met Gln Ala Val Phe Glu Thr Thr Leu Thr Gln Lys Met Asp Gly Val  
1 5 10 15

Met Ile Val Gln Glu Thr Thr Thr Asp Leu Ala Asp Thr Leu Glu Asn  
20 25 30

Ala Ser Ile Ser Ala Glu Lys Ser Glu Gln Lys Pro Glu Arg Leu His  
35 40 45

Pro Gln His Trp Cys Gly Gln His Lys Phe Glu Ala Asp Ser Pro Thr  
50 55 60

Asn Phe Tyr Asp Tyr Thr Asn Ala Lys Glu Lys Glu Lys Ser Ala Met  
65 70 75 80

Cys Arg Val Ala Glu Ile Ala Arg Phe Asn Lys Leu Arg His Val Tyr  
85 90 95

Asn Leu Gln Asp Glu Ser Gly Pro Ala His Lys Lys Leu Phe Thr Val  
100 105 110

Lys Leu Val Leu Thr Glu Ala Glu Thr Phe Glu Gly Ser Gly Thr Ser  
115 120 125

Ile Lys Arg Ala Gln Gln Ala Ser Ala Glu Ala Ala Leu Lys Gly Thr  
130 135 140

Lys Leu Pro Leu Pro Thr Glu Lys Pro Thr Lys Lys Arg Ile Asn Asp  
145 150 155 160

Thr Thr Lys Pro His Arg Val Leu Gln Asn Val Cys Arg Thr Leu Gln  
165 170 175

Tyr	Gln	Met	Pro	Asn	Tyr	Ile	Ser	Cys	Asn	Pro	Pro	Val	Tyr	Pro	Asp			
			180					185					190					
Pro	Gly	Cys	Pro	Leu	Pro	Glu	His	Ile	Leu	Leu	Pro	Leu	Glu	Ser	Met			
		195					200					205						
Ala	Leu	Tyr	Ala	Pro	Pro	Phe	Pro	Thr	Leu	Pro	Ile	Asp	Pro	Ala	Arg			
		210				215					220							
Pro	Gln	Gly	Pro	Lys	Leu	Gln	Ala	Val	Ile	Val	Asn	Ile	Asn	Gly	Lys			
225					230					235					240			
Ser	Ile	Ala	Thr	Gly	Ile	Gly	Glu	Thr	Tyr	Pro	Leu	Ala	Lys	Gln	Asp			
				245					250					255				
Ala	Ala	Ala	Lys	Ala	Leu	Ala	Val	Leu	Ser	Pro	Leu	Leu	Arg	Glu	His			
			260					265					270					
Gln	Asn	Gly	Ser	Asp	Asn	Gly	Phe	Gly	Lys	Glu	Asn	Ile	Pro	Val	His			
		275					280					285						
Lys	Gln	Lys	Ser	Val	Ile	Ser	Asp	Ile	His	Glu	Lys	Ala	Tyr	Gln	Leu			
		290				295					300							
Lys	Val	Asn	Val	Val	Phe	Glu	Val	Leu	Lys	Glu	Glu	Gly	Pro	Pro	His			
305					310					315					320			
Asp	Arg	Gln	Tyr	Val	Val	Arg	Cys	Ala	Phe	Val	Thr	Ser	Gly	Asn	Val			
				325					330					335				
Val	Lys	Ala	Glu	Ala	Val	Gly	Lys	Gly	Lys	Lys	Lys	Lys	Ser	Ala	Gln			
			340					345					350					
Gln	Glu	Ala	Cys	Thr	Gln	Leu	Leu	Ala	Thr	Val	Glu	His	Leu	Thr	Pro			
		355					360					365						
Glu	Asn	Asn	Pro	Val	Ala	Leu	Ala	Thr	Asn	Val	Cys	Lys	Thr	Gln	Lys			
		370				375					380							
Lys	Leu	Ala	Ala	Met	Asn	Arg	Glu	Pro	Lys	Arg	Lys	Thr	Ile	Val	Lys			
385					390					395					400			
Asp	Lys	Lys	Met	Asp	Pro	Leu	Tyr	Gly	His	Gln	Ile	Asn	Pro	Val	Ser			
				405					410					415				
Arg	Leu	Ile	Gln	Val	Thr	Gln	Ala	Lys	Ser	Lys	Glu	His	Pro	Thr	Phe			
			420					425					430					



Glu	Leu	Val	Ala	Glu	His	Gly	Val	Ser	Lys	Tyr	Lys	Glu	Phe	Ile	Ile	435	440	445	
Gln	Val	Lys	Tyr	Gly	Asp	Asp	Val	Gln	Glu	Gly	Lys	Gly	Pro	Asn	Lys	450	455	460	
Arg	Leu	Ala	Lys	Arg	Ala	Ala	Ala	Glu	Ala	Met	Leu	Glu	Ser	Ile	Gly	465	470	475	480
Phe	Val	Lys	Pro	Leu	Pro	Pro	Pro	Gly	Lys	Ser	Leu	Leu	Lys	Lys	Met	485	490	495	
Ile	Asp	Cys	Asp	Pro	Ser	Leu	Pro	Glu	Ile	Ser	His	Trp	Thr	Gly	Pro	500	505	510	
Pro	Pro	Thr	Ala	Val	Ser	Val	Ser	Thr	Ser	Glu	Pro	Asp	Thr	Ser	Glu	515	520	525	
Ala	Ala	Gln	Leu	Ser	Pro	Glu	Gln	Thr	Asp	Ile	Ser	Glu	Lys	Arg	Glu	530	535	540	
Leu	Ser	Pro	Asp	Thr	Glu	Lys	Arg	Arg	Val	Thr	Phe	Asn	Ser	Gln	Val	545	550	555	560
His	Ala	Cys	Pro	Pro	Pro	Gly	Asp	Gln	Asp	Tyr	Pro	Asn	Ser	Ile	Val	565	570	575	
Gln	Ser	Leu	Lys	Lys	Asp	Ala	Ile	Val	Glu	Gly	Lys	Ile	Arg	Arg	Leu	580	585	590	
Lys	Arg	Ser	Lys	Glu	Asn	Arg	Arg	Ala	Leu	Thr	Ala	Glu	Gln	Ile	Val	595	600	605	
Glu	Leu	Ser	Glu	Arg	Ala	Gln	Ser	Tyr	Leu	Gln	Thr	Lys	Asn	Thr	Thr	610	615	620	
Ile	Gln	Ser	Ser	Gln	Ser	Ser	Ser	Ala	His	His	His	Leu	Glu	Gln	Leu	625	630	635	640
Ser	Asp	Phe	Phe	Lys	Phe	Ser	Leu	Gln	Tyr	Thr	Ser	Phe	Pro	Gln	Val	645	650	655	
Gly	Ile	Asp	Gln	His	Phe	Thr	Ile	Val	Ser	Ile	Gly	Leu	Glu	Ala	Pro	660	665	670	
Leu	Val	Gly	His	Gly	Thr	Gly	Cys	Ser	Thr	Thr	Glu	Ala	Asp	Glu	Asn	675	680	685	

Ala Ala Leu Asp Ala Ile Ala Lys Leu Lys Glu Leu Ser Ala Ser Lys  
690 695 700

Thr  
705